
Crataegus spes-aestatum, a New Species in Series *Punctatae* (Rosaceae), and Six New Varietal Names from the Missouri *Crataegus* Flora

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ABSTRACT. *Crataegus spes-aestatum* J. B. Phipps is described as a new species from Missouri and Illinois. It is critically compared to *C. dawsoniana* Sargent, to which it keys out in the article where that species was published, and which is here lectotypified. Also, lectotypes for the following new combinations or status from the Missouri *Crataegus* flora are designated: *C. collina* Chapman var. *hirtiflora* (Sargent) J. B. Phipps, *C. crus-galli* L. var. *regalis* (Beadle) J. B. Phipps, *C. pruinosa* (H. L. Wendland) K. Koch var. *magnifolia* (Sargent) J. B. Phipps, *C. reverchonii* Sargent var. *palmeri* (Sargent) J. B. Phipps, *C. viridis* L. var. *glabriuscula* (Sargent) J. B. Phipps, and *C. viridis* L. var. *nitens* (Sargent) J. B. Phipps. In addition, lectotypes are designated for the varietal basionyms *C. hirtiflora* Sargent, *C. regalis* Beadle, *C. magnifolia* Sargent, *C. palmeri* Sargent, and *C. glabriuscula* Sargent, as well as for several of the species names involved, *C. collina* Chapman, *Mespilus pruinosa* H. L. Wendland, and *C. reverchonii* Sargent. Also, a lectotype and epitype for *C. berberifolia* Torrey & A. Gray, a species with a Missouri variety, are indicated.

Key words: *Crataegus*, Missouri, Rosaceae.

Intensive study of over 4000 hawthorn specimens for George Yatskievych's *Steyrmark's Flora of Missouri* results in the recognition of a new species for the state, *Crataegus spes-aestatum* J. B. Phipps. In this paper I shall describe this long-overlooked member of the Missouri *Crataegus* flora and also establish six new varieties based on earlier species names of Sargent and Beadle. The new varieties are: *C. collina* Chapman var. *hirtiflora* (Sargent) J. B. Phipps, *C. crus-galli* L. var. *regalis* (Beadle) J. B. Phipps, *C. pruinosa* (H. L. Wendland) K. Koch var. *magnifolia* (Sargent) J. B. Phipps, *C. reverchonii* Sargent var. *palmeri* (Sargent) J. B. Phipps, *C. viridis* L. var. *glabriuscula* (Sargent) J. B. Phipps, and *C. viridis* L. var. *nitens* (Sargent) J. B. Phipps. The autonoms for the varietal combinations will also be typified where necessary.

CRATAEGUS SPES-AESTATUM

Working at US in summer 1996, I located a number of specimens of an unusual *Crataegus collina* Chapman-like taxon, all collected by E. J. Palmer, and requested their loan. Then, during 2000–2001, working with G. Yatskievych in St. Louis, I found further examples of the same entity, one collected by J. H. Kellogg, such that 12 specimens of this entity are now recorded by me at MO and US. All except the Kellogg record (1908) were collected by Palmer from 1919–1931 in southern Illinois and counties mostly close to the Mississippi in the southern half of Missouri. These had been variously determined as *C. vicina* Sargent, *C. sucida* Sargent, and *C. mollis* (Torrey & A. Gray) Scheele \times *C. sucida*, but to me were clearly none of these. Although Palmer's inconsistent determinations suggested substantial variability, these 12 collections appeared not only to be taxonomically identical, but rather invariant. Interestingly, none of the specimens of the new entity located by me at US or MO had been filed under *C. collina*. They differed strikingly from *C. collina* in their sharply lobed and rhombic-elliptic leaf shape of a size at the upper limit for that species, thus making them reminiscent of certain forms of *C. viridis* L. Because of this, I initially considered the possibility that they represented a hybrid entity. Indeed, keying them out in Sargent (1908) led to *C. dawsoniana* Sargent, placed by him in group *Virides*, but now regarded as a putative interserial hybrid (Phipps, 2005). Accordingly, I accessed the syntypes and other authentic material of *C. dawsoniana* from A and made comparisons (Table 1) between *C. dawsoniana* and *C. collina*. These comparisons, however, indicate that the new entity is much closer to *C. collina*. The main differences between the new entity and *C. dawsoniana* lay in the denser indumentum of the leaves of the Palmer and Kellogg collections, slightly different leaf shape, much larger flowers, and less pruinose fruit. Although Palmer had mostly labeled these specimens as the *collina* segregates *C. vicina* (leaves not or barely lobed) or *C. sucida* (leaves unlobed), there is a distinct and quite sharp lobing (see Fig. 1) in the leaves of the

Table 1. Differences between *Crataegus spes-aestatum*, *C. dawsoniana*, and *C. collina* var. *collina*. Parenthetic numbers indicate indumentum density on a scale from 0 (glabrous) to 5 (very dense). Abbreviations: AA, Arnold Arboretum; fl., flowered; S, southern.

| Characteristic | <i>C. dawsoniana</i> | <i>C. spes-aestatum</i> | <i>C. collina</i> var. <i>collina</i> |
|--------------------|--|--|---|
| 1-yr.-old twigs | deep chestnut, \pm shiny | chestnut, shiny | grayish brown |
| Thorns | not observed | thin, straight, 3–5 cm long, shiny, dark | slender to \pm stout, \pm straight, blackish |
| Leaves at anthesis | | | |
| Petioles | glabrous below, thin-pilose on top (2 to 3) | canescent (5) | pubescent to canescent (4 to 5) |
| Adaxial surface | nearly glabrous | appressed-scabrous- pubescent (4) | scabrous-pubescent when young (3 to 4) |
| Adaxial veins | scabrous (3) | very short-scabrous (3) | very short-scabrous (3 to 4) |
| Abaxial surface | glabrous | thin hairy (1) | thin hairy (1 to 2) |
| Abaxial veins | glabrous | canescent (4 to 5) | appressed-pubescent (5) |
| Leaf shape | apex acute, lobes very short | apex acuminate, more prominent lobes | usually narrow obovate, small or no lobes |
| Anthesis date | 1 June 1900 (at AA) | 10 May 1923 (S IL); 25 Apr. 1931 (S MO, rather late fl.); 26 Apr. 1931 (S MO, full fl.); 27 Apr. 1931 (S MO) | 24–30 Apr. (S MO) |
| Pedicels | thin spreading-pubescent (2 to 3) | canescent (4) | appressed-pubescent (4 to 5) |
| Bracteoles | linear, membranous, green, gland margined | linear to broader, greenish, gland serrate | linear, membranous, gland bordered |
| Flower diameter | 14–15 mm | 20–22 mm | 13–18 mm |
| Hypanthium | pubescent (3) | white-canescant (5) | glabrous-thin pubescent (4 to 5) |
| Sepals | entire to slightly glandular-serrate | deeply glandular-serrate | glandular-serrate |
| Styles | 4 or 5 | 5 | 3 to 5 |
| Fruit | 8–10 mm diam., pruinose, smooth, slightly pyriform, calyx lobes reflexed | 10–12 mm diam., not pruinose, some hair left, calyx lobes reflexed, surface matte, \pm globose | 8–14 mm diam., usually \pm glabrous |

new entity, which immediately puts it out of these segregate taxa. The striking leaf size and shape characteristics of the new entity, as well as the rather more glabrate fruit, thus differentiate it from any variant of *C. collina*. The quite extensive and mainly Mississippian two-state distribution is also distinctive. Accordingly, I considered the new entity sufficiently distinct to warrant specific rank and describe it below. The similarities are closest between *C. spes-aestatum* and *C. collina*, however, requiring placement of the novelty in *Crataegus* ser. *Punctatae* (Loudon) Rehder.

Crataegus spes-aestatum J. B. Phipps, sp. nov.
TYPE: U.S.A. Missouri: Bollinger Co., 26 Apr. 1931, *E. J. Palmer 39098* (holotype, MO; isotype, US). Figure 1.

A *Crataegus collina* differt in ramunculis annotinis nitidis castaneo-brunneis (non cinereo-brunneis), acanthibus semper tenuibus (non, ut saepe, validis); apicibus laminarum acutioribus, lobis acutioribus (non apicibus laminarum minus acutis, lobis aut absentibus, praeter *C. collinam* var.

lettermanii); floribus majoribus (20–22 mm. diam. potius quam 13–18 mm diam.), lobis calycis penitus (non, ut plerumque, moderate) glandulo-serratis.

Shrubs or small trees, 3–6 m tall; extending shoots canescent; 1-yr.-old twigs reddish brown, older \pm pale gray; thorns on 2-yr.-old wood 2.5–6 cm long, fairly slender, silver-black, straight or slightly curved. Leaves deciduous; petioles 0.75–1.5 cm long, ca. 20%–25% blade length, densely pubescent young, subglabrous later, with a few sessile glands; blades 3–4 cm long (at anthesis), 4–6 cm at maturity, \pm rhombic-elliptic; apex acuminate, base cuneate; 3 or 4 shallow but acute lobes per side; margins sharply toothed, teeth gland-tipped; venation craspedodromous, 4 to 5 main secondary veins per side; adaxial surface scabrous-pubescent when young, abaxially densely pubescent on the veins when young, with scattered pubescence elsewhere on the lower surface. Inflorescences 6- to 12-flowered; branches densely canescent, bearing caducous, linear, membranous or somewhat chlorophyllous, gland-margined bracteoles.

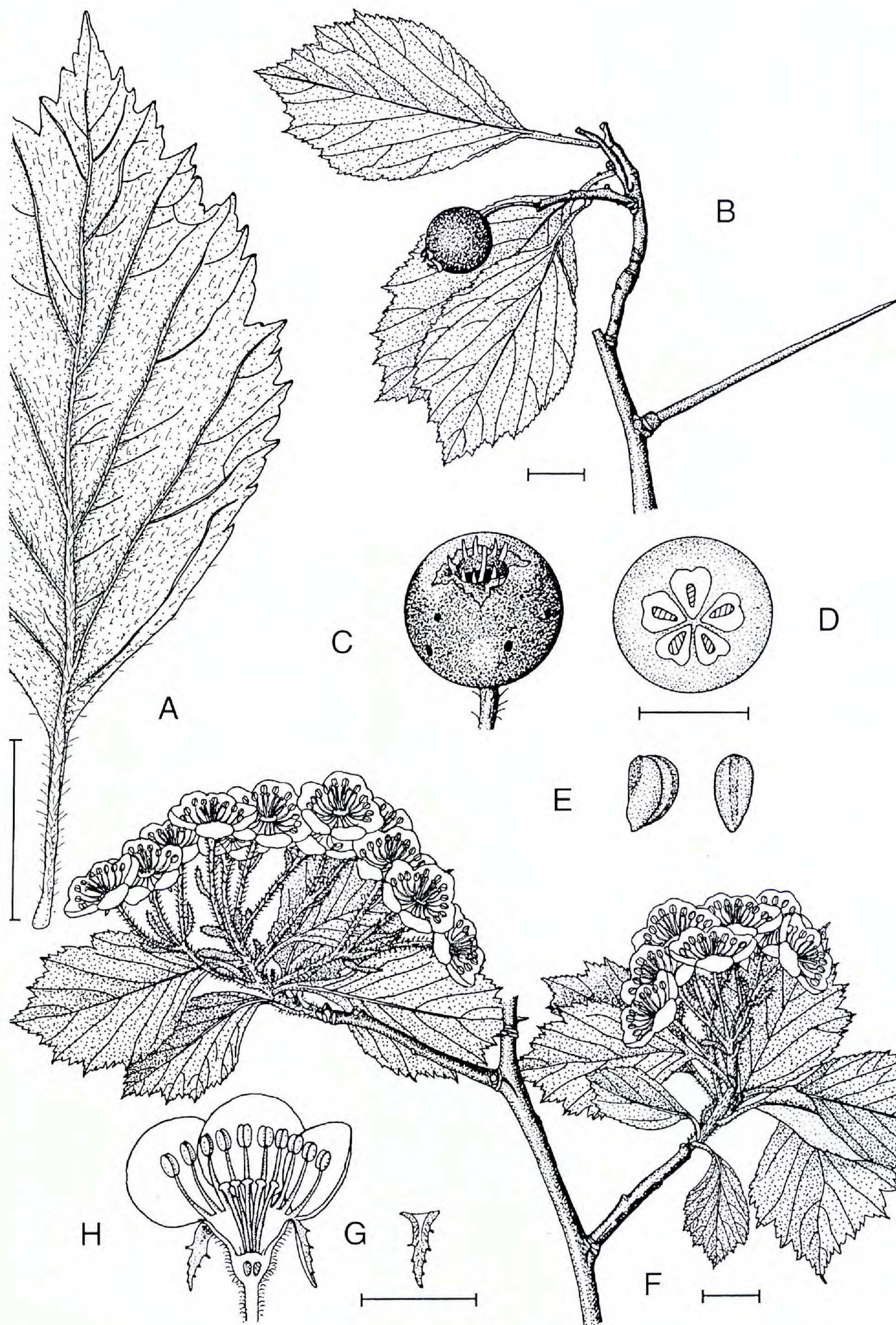


Figure 1. *Crataegus spes-aestatum* J. B. Phipps. —A. Partial leaf magnification, abaxial surface. —B. Fruiting twig with foliage. —C. Fruit. —D. Fruit, section. —E. Nutlets, side and dorsal views. —F. Inflorescences and twig part. —G. Single calyx lobe. —H. Flower section. Inflorescence and flower parts from *E. J. Palmer 39098* (MO) and *E. J. Palmer 39077* (MO); fruiting stage from *E. J. Palmer 17000* (MO). Scale bars = 1 cm.

Flowers 20–22 mm diam.; hypanthium externally canescent; calyx lobes narrow-triangular, abaxially thinly pubescent, glandular-serrate; petals \pm circular, white; stamens 20, anthers “yellow” or “cream-colored” (Palmer, from cited specimens); styles 5. Fruit 10–12 mm diam. (dry), \pm globose, \pm glabrous but short-pubescent at top and bottom, surface matte, apparently red; calyx lobes recurved \pm eroded; nutlets 3 to 5, dorsally grooved, sides plane.

Crataegus spes-aestatum is known from southern Illinois and in southern, south-central, and southeastern Missouri from only nine collection numbers (12 specimens) and is mainly recorded from thickets, low hills, dry open woods, and alluvial riverbanks. *Crataegus spes-aestatum* has not been with certainty seen for over 70 years and resembles *C. fecunda* Sargent in this respect, as well as in its distribution pattern and frequency. Indeed, the much greater rarity of all Missouri *Crataegus* since the first half of the last century (Phipps, 2005) is quite noteworthy, and *C. spes-aestatum* and *C. fecunda* are far from the only examples of probable extinction of local biotypes in the state (Phipps, 2005; G. Yatskievych, pers. comm.). Such intriguing parallels between *C. spes-aestatum* and *C. fecunda* call out for further enquiry.

The name honors Bill Summers, the important Missouri hawthorn collector, who has made strenuous efforts to relocate the new species in southeastern Missouri. Further serious searching through the historic range of *Crataegus spes-aestatum* is still required to determine if it survives into the 21st century. The specific epithet is derived from *spes* (Latin) = hope and *aestatum* (Latin) = summers. The hyphen use, supported by Art. 60.9 of the *International Code of Botanical Nomenclature (St. Louis Code)* (ICBN) (Greuter et al., 2000), is intentional, and should not be changed.

Paratypes. U.S.A. **Illinois:** Pope Co., nr. Golconda, *E. J. Palmer 22584* (US); Golconda, *E. J. Palmer 17000* (MO), *E. J. Palmer 15426* (US), 23672 (US). **Missouri:** Bollinger Co., nr. Patton, *E. J. Palmer 39098* (MO, US); Cape Girardeau Co., nr. Cape Girardeau, *E. J. Palmer 39077* (MO, US); Greene Co., SW Springfield, *J. H. Kellogg 110* (MO); St. Genevieve Co., nr. Appleton, *E. J. Palmer 39109* (MO, US), 39110 (MO).

CRATAEGUS DAWSONIANA

Crataegus dawsoniana Sargent, Rep. (Annual) Missouri Bot. Gard. 19: 88. 1908. TYPE: U.S.A. Massachusetts: Jamaica Plain, Arnold Arboretum, cult. from Letterman seed 462.3, East St. Louis, Illinois, 1 June 1901, *C. S. Sargent 4428* (lectotype, designated here, A).

In order to formalize the comparisons of *Crataegus spes-aestatum* and *C. dawsoniana*, lectotypification of the latter is required. The lectotype is a good-quality specimen in full flower exactly matching the protologue description. Other specimens at A raised from the same seed batch are also labeled *Sargent 4428*, but were collected at different times (viz., 7 June 1901, Forest Hill entrance; 8 Oct. 1900; 8 Nov. 1898). There is now no way to determine for sure if these specimens actually came from the same tree and also, as there is some variation in leaf shape, making any of them isolectotypes is not appropriate. All the *C. dawsoniana* syntypes had been accessed originally as *C. nitida* (Engelmann) Sargent, a member of series *Virides* (Loudon) Rehder, but it is more likely that *C. dawsoniana* represents an interserial hybrid between series *Punctatae* and series *Virides*.

NEW CRATAEGUS NAMES FROM MISSOURI

Several new combinations are required for the third volume of the floristic project *Steyermark's Flora of Missouri*, of which the first two volumes have been published (Yatskievych, 1999, 2006).

1. Crataegus berberifolia Torrey & A. Gray, *Flora of North America* 1: 469. 1840. TYPE: U.S.A. Louisiana: Opelousas, July [no year given], *Carpenter 20* (lectotype, designated here, NY). EPITYPE: U.S.A. Louisiana: Opelousas, in flower, s.d., *Carpenter s.n.* (epitype, designated here, NY).

The information in the protologue, which indicates a specimen collected in July, permits only one candidate for lectotype, that selected. However, its quality being inadequate, I am adding a flowering specimen in excellent condition as epitype.

Crataegus berberifolia is represented in Missouri by its variety *engelmannii* (Sargent) Eggleston, which differs from the type variety in possessing 10 stamens with pink-purple anthers (instead of 20, cream) and generally larger flowers, ca. 18 mm in diameter in the type material (instead of ca. 12 mm). *Crataegus berberifolia* var. *berberifolia* forms are concentrated in Louisiana, while variety *engelmannii* forms range widely through the southeastern quarter of the United States. *Crataegus berberifolia* belongs to series *Crusgalli* (Loudon) Rehder.

2. Crataegus collina Chapman, *Flora of the Southeastern United States*, 2nd ed. Suppl.: 684. 1892. TYPE: U.S.A. Georgia: Floyd Co., Rome, spring 1882, *A. W. Chapman s.n.* (lectotype, designated here, GH).

The lectotype is an excellent-quality flowering specimen that is a good match for the protologue.

2a. *Crataegus collina* Chapman var. *hirtiflora* (Sargent) J. B. Phipps, comb. et stat. nov. Basionym: *Crataegus hirtiflora* Sargent [as *hirtiflora*], Rep. (Annual) Missouri Bot. Gard. 19: 82. 1908. TYPE: U.S.A. Missouri: Taney Co., Swan, 20 Apr. 1907, *B. F. Bush* 8 (lectotype, designated here, A; duplicate, A).

The lectotype is an excellent match for the protologue and is one of the two specimens of this number seen by me. This collection number was the one designated "type" by Sargent in the 1908 protologue. Sargent spelled the specific epithet "*hirtiflora*" in his protologue (1908: 82), repeating this in his key to series *Punctatae* on page 76 of the same paper. There is no Latin word or root of the form "*hirt-*"; however, the flower is so evidently hairy that Sargent's "*hirtiflora*" must be regarded as a typographic error, symptomatic of the quite numerous small slips that litter his publications, and the correction to the spelling, first made by Palmer (1925), though without explanation, is in accordance with Art. 60 of the ICBN (Greuter et al., 2000).

Crataegus collina var. *hirtiflora* shares the typical variety *collina* characteristics of indumentum, twig and thorn color, inflorescence, flower, and fruit features, but differs in possessing a relatively much broader leaf blade (1.3 long:1 wide, or less in var. *hirtiflora*, 1.4–1.6:1 in var. *collina*) with relatively greater expansion at anthesis (\pm full grown at anthesis in var. *hirtiflora*; 1/3–2/3 full grown in var. *collina*). In Missouri, *C. collina* var. *hirtiflora* is found commonly throughout the range of the species, and most specimens can be assigned without ambiguity. Outside of Missouri, however, the range is inadequately documented. *Crataegus collina* var. *hirtiflora* belongs to series *Punctatae* (Loudon) Rehder. The two varieties compared above are the most abundant forms of *C. collina* in Missouri, but other varieties exist, distinguished primarily on leaf shape. Consequently, a key to the varieties of *C. collina*, as well as to some putative interserial hybrids (noted in the key as ISH), is provided here.

KEY TO VARIETIES OF *CRATAEGUS COLLINA* IN MISSOURI AND SOME PUTATIVE INTERSERIAL HYBRIDS RESEMBLING THEM

- 1a. Styles and nutlets usually 5; upper surface of young leaves generally dense scabrous-pubescent (except *C. collina* var. *sordida*); leaves at flowering time commonly only 1/3–1/2 expanded [*C. collina* varieties] 2
- 1b. Styles and nutlets usually 2 to 3; surface of young leaves generally subglabrous to only sparsely hairy;

- leaves at flowering time 1/2 or more expanded [mainly putative hybrids with *C. crus-galli* group] 9
- 2a. Stamens usually 20; leaves lobed or not 3
- 2b. Stamens 5 to 15(20); leaves evidently lobed
. *C. collina* var. *lettermanii* (Sargent) Eggleston
- 3a. Anthers white or cream 4
- 3b. Anthers rose 7
- 4a. Leaf blades at anthesis mainly broader (1.2–1.6:1) 5
- 4b. Leaf-blades at anthesis long, narrow (\geq 1.75:1)
. *C. collina* var. *succincta* (Sargent) E. J. Palmer
- 5a. Lobing of leaf blades evident, but perhaps shallow and irregular; marginal teeth sharp or not 6
- 5b. Blades \pm obovate, not lobed; marginal teeth sharp
C. sucida Sargent (included in *C. collina* var. *hirtiflora*)
- 6a. Leaves generally narrower, 1.4–1.6:1, generally widest toward the tip; 1/3–2/3 full grown at anthesis; stamens 20 *C. collina* var. *collina*
- 6b. Leaves broad, 1.3:1 or less; widest in the middle, \pm full grown at anthesis; stamens (15 to 20)
. *C. collina* var. *hirtiflora*
- 7a. Leaf blades at anthesis long, narrow (\geq 1.75:1)
C. angustata Sargent (included in *C. collina* var. *succincta*)
- 7b. Leaf blades at anthesis broader than 1.5:1 8
- 8a. Flowers \leq 17 mm diam., styles usually 5
. *C. collina* var. *sordida* (Sargent) Eggleston
- 8b. Flowers 20–22 mm diam., styles 3 to 5
. *C. verruculosa* Sargent (ISH)
- 9a. Stamens 20; veins beneath at most thin-pubescent; inflorescence branches pilose
. *C. collina* var. *collicola* (Ashe) E. J. Palmer (ISH)
- 9b. Stamens 10 to 15; veins below quite pubescent; inflorescence branches pubescent
. *C. incaedua* Sargent (ISH)

3. *Crataegus crus-galli* L., Species Plantarum. 1: 476. 1753. TYPE: U.S.A. "Virginensis," LINN 643.9 (lectotype, designated by Phipps (1988: 364–365), LINN).

3a. *Crataegus crus-galli* L. var. *regalis* (Beadle) J. B. Phipps, comb. et stat. nov. Basionym: *Crataegus regalis* Beadle, Biltmore Bot. Stud. 1: 134. 1902. TYPE: U.S.A. Georgia: Floyd Co., Rome, 30 Apr. 1900, *C. D. Beadle* B2251 (lectotype, designated here, US).

Beadle (1902: 134) did not explicitly cite a type for *Crataegus regalis*, rather he spoke of "original specimens"; the lectotype is an excellent specimen of that mentioned by Beadle in the protologue as coming from the type locality and matches the protologue exactly.

Crataegus crus-galli var. *regalis* is a distinctive variant of *C. crus-galli* that is characterized by often rather large, to 7 cm long, \pm elliptic, acute-tipped leaves of a peculiar dark green color and has \pm sharp marginal teeth over 1 mm long that are unusually large for members of the *C. crus-galli* complex, with the exception of *C. fecunda*. By contrast, variety *crus-galli* represents the rather variable remainder of the gamut of leaf form found in *C. crus-galli*, i.e.,

lacking the distinctive features of variety *regalis* and occurring throughout the range of the species. The only other variety of *C. crus-galli* that I recognize from Missouri is variety *capillata* Sargent, which is weakly differentiated from the type variety by its sparsely pilose pedicels. *Crataegus crus-galli* var. *regalis* is widely scattered in the south-central part of the species' range from Missouri and Illinois to Georgia and belongs to series *Crus-galli* (Loudon) Rehder.

4. *Crataegus pruinosa* (H. L. Wendland) K. Koch. Hortus Dendrologicus 168. 1853. Basionym: *Mespilus pruinosa* H. L. Wendland, Flora 44: 710. 1823. TYPE: Germany: Herrenhausen Botanical Garden, nr. Hannover, cultivated, fruiting specimen, 1823, C. A. Fischer s.n. (lectotype, designated here, GOET).

Fischer's specimen was located by Jochen Heinrichs, curator of GOET, and is the only known candidate for the type of *Mespilus pruinosa*. Only one fruit is present, from which it is possible to discern at least 15 stamen bases. The lectotype proves to represent a relatively small-leaved, shallowly lobed form of *Crataegus pruinosa*, of the northeastern part of the United States and adjacent Canada, which has often been called variety *parvula* (Sargent) J. B. Phipps.

4a. *Crataegus pruinosa* (H. L. Wendland) K. Koch var. ***magnifolia*** (Sargent) J. B. Phipps, stat. nov. Basionym: *Crataegus magnifolia* Sargent, Trees and Shrubs 2: 69. 1908. TYPE: U.S.A. Missouri: Jasper Co., nr. Webb City, 30 Apr. 1905, E. J. Palmer 26 (lectotype, designated here, A).

Sargent cited *Palmer 26* as the type in his protologue, and this is one of three specimens of that number seen by me at MO. All match the protologue exactly.

Crataegus pruinosa var. *magnifolia* differs from all other varieties of *C. pruinosa* by its very large leaf size (5–7 cm long vs. 3–6 cm in other varieties of *C. pruinosa*) and in its obscure leaf lobing (sharply lobed in other varieties). This is a local, but distinctive, race from southwestern Missouri that has not been seen for many years. *Crataegus pruinosa* var. *magnifolia* belongs to series *Pruinosae* (Sargent) Rehder.

5. *Crataegus reverchonii* Sargent, Trees and Shrubs II: 55. 1903. TYPE: U.S.A. Texas: Dallas, Apr. 1880, J. Reverchon 280 (lectotype, designated here, A).

The lectotype is a good-quality flowering specimen matching the protologue precisely.

5a. *Crataegus reverchonii* Sargent var. ***palmeri*** (Sargent) J. B. Phipps, comb. et stat. nov. Basionym: *Crataegus palmeri* Sargent, Trees and Shrubs II: 57. 1903. TYPE: U.S.A. Missouri: Jasper Co., Prosperity Jct., Webb City, 6 May 1902, E. J. Palmer 1a (lectotype, designated here, A).

Crataegus reverchonii var. *palmeri* is distinguished from variety *reverchonii* by much larger short shoot leaves (4–6 cm vs. 2–3.5 cm long), foliage being dark (not so in type variety), larger flowers (10–12 mm diam. vs. 8–10 mm), greater plant size (6–8 m tall vs. 1–3 m), and style number (2 to 3 vs. 3 to 5). There are no other varieties of *C. reverchonii* that I recognize at present.

Sargent cites six Palmer specimens from Webb County or Carthage, Missouri; none are designated as type in the protologue. From these, I choose for lectotype a high-quality specimen that matches the protologue well.

Crataegus reverchonii var. *palmeri* is effectively a form of *C. reverchonii* that is larger in stature (to 8 m tall vs. 1–3 m), leaf size (4–6 cm long vs. 2–3.5 cm), and flower diameter (10–12 mm vs. 8–10 mm), with fewer styles (2 to 3 vs. 3 to 5) and a mostly allopatric distribution. It also has the characteristic in exsiccatae, when it can be reliably interpreted, of drying a darker color. Whereas *C. reverchonii* var. *reverchonii* is most abundant in Texas and Oklahoma and only just reaches the southwestern corner of Missouri, variety *palmeri* has a wide range through the southeastern quarter of the United States. *Crataegus reverchonii* belongs to series *Crus-galli* (Loudon) Rehder.

6. *Crataegus viridis* L., Species Plantarum 1: 476. 1753. TYPE: U.S.A. "Virginia," J. Clayton 526 (lectotype, designated by Eggleston (1908: 83), BM).

6a. *Crataegus viridis* L. var. ***glabriuscula*** (Sargent) J. B. Phipps, comb. et stat. nov. Basionym: *Crataegus glabriuscula* Sargent, Bot. Gaz. 31: 235. 1901. TYPE: U.S.A. Texas: Dallas, 15 Apr. 1900, B. F. Bush 493 (lectotype, designated here, A; duplicate, A).

Sargent cites two specimens in the protologue, one collected by Bush and the other by Reverchon; neither was designated as type. I select the lectotype as being a high-quality specimen that is an excellent match for the protologue. There is also an isolectotype at A. The other syntype for *Crataegus glabriuscula* cited by Sargent (1901: 235) is *J. Reverchon 1* (A), also from Dallas, Texas, July 1899.

Crataegus viridis var. *glabriuscula* has the classic *C. viridis* characteristics of being glabrous in all parts, abaxial leaf vein axils excepted, and having \pm eglandular bracteoles, \pm entire sepals, 3 to 5 styles and nutlets, and small fruit. It is notable for small, elliptic to nearly suborbiculate, \pm unlobed, rather chartaceous leaves with large marginal teeth. By contrast, variety *viridis* has thin, ovate leaves with 1 or 2 sharp lobes per side, generally small marginal teeth, and only 3 lateral veins per side (vs. 4 or 5 in var. *viridis*). Other varieties of *C. viridis* in Missouri are variety *nitens* (Sargent) J. B. Phipps, treated next, variety *ovata* (Sargent) E. J. Palmer, and variety *lanceolata* (Sargent) E. J. Palmer. Both of the latter have essentially unlobed leaves and small leaf teeth; the leaves of variety *ovata* being elliptic-ovate in shape and of variety *lanceolata* lanceolate. *Crataegus viridis* var. *glabriuscula* is generally easily distinguished with good material both in the herbarium and the wild, although a small number of intermediate specimens are found. It occurs exclusively in the southwestern part of the species' range from southwestern Missouri and southeastern Kansas through eastern Oklahoma to central and southern Texas. *Crataegus viridis* var. *glabriuscula* and var. *nitens* belong to series *Virides* (Loudon) Rehder.

6b. *Crataegus viridis* L. var. *nitens* (Sargent) J. B. Phipps, comb. et stat. nov. Basionym: *Crataegus nitens* Sargent, Rep. (Annual) Missouri Bot. Gard. 22: 76. 1911. TYPE: U.S.A. Missouri: Marion Co., Hannibal, 14 May 1909, *J. Davis 61* (holotype, A).

Sargent's type specimen is an excellent match for the protologue.

Crataegus viridis var. *nitens* also has the classic *C. viridis* characteristics noted under variety *glabriuscula* of being glabrous in all parts, abaxial leaf vein axils excepted, and having \pm eglandular bracteoles, \pm entire sepals, 3 to 5 styles and nutlets, and small fruit. It is distinguished from variety *viridis* by a short ovate leaf of somewhat coriaceous texture, whereas variety *viridis* has a longer, more narrowly ovate, thin leaf.

Compared to variety *glabriuscula*, which also can have shortish, somewhat coriaceous leaves, those of variety *nitens* are generally clearly lobed and have small marginal teeth like those of varieties *viridis*, *ovata*, and *lanceolata*. *Crataegus viridis* var. *nitens* is only known from its type area and has not been seen in recent years.

Acknowledgments. The curators of A, MO, and US are thanked for loan of material, and my colleague Antony Littlewood, of the University of Western Ontario, Department of Classical Studies, is thanked for critically checking the Latin diagnosis. Susan Laurie-Bourque of Ottawa, Ontario, produced the elegant line illustration. I also thank George Yatskievych for maintaining the database of Missouri *Crataegus* syntype material to which I have access and also for commenting on drafts of the manuscript.

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